

WHOLE PLANTS AS RENEWABLE ENERGY RESOURCES: CHECKLIST OF 508 SPECIES ANALYZED FOR HYDROCARBON, OIL, POLYPHENOL, AND PROTEIN

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William B. Roth, I. M. Cull, R. A. Buchanan, and M. O. Bagby¹

Northern Regional Research Center
Agricultural Research Service
U.S. Department of Agriculture
1815 North University Street
Peoria, Illinois 61640

ABSTRACT

Since 1974, a total of 508 plant species representing 80 families have been analyzed by our laboratory for hydrocarbon, oil, polyphenol, and protein contents. Of these species, 372 were from Illinois, 26 from Wisconsin, 24 from Georgia, 20 from Arizona, 10 or less from 12 other states, and 36 from foreign lands. Families receiving the greatest emphasis were Leguminosae, Compositae, Gramineae, Labiateae, and Euphorbiaceae representing 97, 84, 42, 32, and 23 species, respectively.

INTRODUCTION

Beginning in 1974, our search for potential multi-purpose crops for energy, food, feed, fiber, and strategic materials has concentrated on under-utilized plant species collected from the wild.

Petroleum shortages and the ensuing spiraling prices of crude oil and petroleum-based materials have resulted in programs to study many alternative forms of energy (Ableson 1979). Renewable plant biomass is one of the principal resources with the potential to meet some of our energy, strategic material, and chemical needs. Our research has focused on evaluation of 508 whole plants as a source of hydrocarbon for chemical feedstocks. We have compiled this checklist primarily as an aid to scientists wanting to know which species have been analyzed at the Northern Regional Research Center. Numerical crop ratings assigned to these plants are an indicator of their chemical/botanical nature.

¹Chemist; Botanist; Chemist (retired); Chemist. Northern Agricultural Energy Center.

MATERIALS AND METHODS

Our research has been conducted on mature whole plants from various regions of the United States, with 372 species collected in Central Illinois. Plant samples were collected mainly from natural stands and air dried, ground to pass a 1-mm perforated screen, and partitioned into major fractions by solvent extraction (Buchanan et al 1978, 1979; Roth et al 1980, 1981). A preliminary evaluation procedure for plant species was based on botanical characteristics, chemical composition, and fiber structure.

Decision factors were identified and criteria were established. Subsequently, a numerical rating system was developed which employs the factors and criteria. Each factor was assigned a score based on an arbitrary criterion range. The most desirable trait under consideration receives the lowest score. The sum of the scores provides the crop rating.

Botanical characteristics were classified into 5 groups according to their probable influence on crops for mechanized agriculture in the temperate United States and to their estimated yield of biomass. Using a scale of 1 to 5, we assigned (1) to vigorous soil-growing, perennial, temperate species which grow 1.5 m/yr with a moderate amount of moisture (mesic), are harvestable by clipping, and having coppicing potential. Other perennial and all annual temperate, mesic species are scored 2 or 3 according to growth rate. Annual species exceeding 1.5 m/yr and perennials reaching 0.5-1.5 m/yr score 2. Scores of 3 are assigned to species that produce hydrocarbon-rich fruit, roots, rhizomes, or bulbs, or that are lactiferous and could produce hydrocarbon by tapping. Furthermore, the annuals should grow 0.5-1.5 m/yr and the perennial less than 0.5 m/yr. A score of 4 applies to all species of marsh plants, vines, rosette plants, low-growing succulents and sod-forming grasses. A score of 5 applies to species that are aquatic, or tropical or are epiphytes or parasites.

Other decision factors are scored according to fiber characteristics and chemical contents. Fibrous or weedy species judged qualitatively to have potential for fiber, paper pulp, or hardboard are scored 1, while a score of 2 indicates succulent, pulpy, non-fibrous species. Apparent protein contents (Kjeldahl N x 6.25) exceeding 14 percent score 1, and all others score 2. Oil and hydrocarbon contents are determined by step wise acetone extraction followed by cyclohexane or hexane. Subsequently, the acetone soluble fraction is partitioned between hexane/aqueous ethanol. The first hexane fraction is referred to as hydrocarbon and the second as oil. These values are used to assign scores ranging from 1 to 4. Hydrocarbon values exceeding 2 percent score 1, 1.2-2.0 percent score 2, 0.4-1.2 score 3, and lower than 0.4 percent score 4. Similarly, oil values exceeding 8 percent score 1, 5-8 percent score 2, 2-5 percent score 3, and less than 2 percent score 4.

DISCUSSION

Numerical plant ratings are indicative of the plant's potential as hydrocarbon crops. Species scoring 11 or less are considered either potential hydrocarbon or oil-producing crops and receive further attention in the laboratory and from plant scientists (Buchanan et al 1978, 1979; Roth et al 1980, 1981). For example, hydrocarbon and oil fractions occurring in sufficient quantities were examined by thin-layer and gel permeation chromatography, infrared spectroscopy, and ^{13}C

nuclear magnetic resonance spectroscopy (Buchanan et al 1979; Bagby et al 1981; Swanson et al 1979).

In the following checklist each plant is listed by family, genus, species, collection site (state), numerical rating, and common name. Analytical data for the more promising species (rating of 11 or lower) have been reported by Buchanan et al 1978, 1979; and Roth et al 1980, 1981. Chemical and botanical data for all species listed in this checklist are available from NRRC. Voucher specimens were prepared only from the Illinois and Wisconsin plants and deposited in our herbarium. Samples submitted by U.S. collaborators were generally received as air-dried plant material. A list of these species was submitted to the USDA Plant Taxonomy Laboratory to have names confirmed and authorities supplied.

**CHECKLIST OF WHOLE PLANT
(508 Species)**

	<u>Location¹</u>	<u>Rating²</u>	<u>Common Name</u>
Aceraceae			
<i>Acer negundo</i> L.	IL	11	BOX ELDER
<i>A. platanoides</i> L.	IL	11	NORWAY MAPLE
<i>A. saccharinum</i> L.	IL	10	SILVER MAPLE
<i>A. saccharum</i> Marsh.	IL	12	SUGAR MAPLE
Amaranthaceae			
<i>Amaranthus retroflexus</i> L.	IL	14	PIGWEED
<i>Celosia argentea</i> L.	IL	13	GARDEN-ESCAPE CELOSIA
<i>Froelichia floridana</i> (Nutt.) Moq.	IL	13	COTTONWEED
<i>F. gracilis</i> (Hook.) Moq.	IL	13	COTTONWEED
Anacardiaceae			
<i>Rhus aromatica</i> Ait.	IL	11	FRAGRANT SUMAC
<i>R. aromatica</i> Ait., var. <i>arenaria</i> (Greene) Fern.	IL, GA	11	
<i>R. copallina</i> L.	GA	11	SHINING SUMAC
<i>R. glabra</i> L.	IL, GA	10, 10	SMOOTH SUMAC
<i>R. laurina</i> Nutt.	CA	8	LAUREL
<i>R. ovata</i> S. Wats.	AZ	11	SUGAR SUMAC
Annonaceae			
<i>Asimina triloba</i> (L.) Dunal	IL	11	COMMON PAWPAW
Apocynaceae			
<i>Apocynum androsaemifolium</i> L.	IL	10	SPREADING DOGBANE
<i>A. cannabinum</i> L.	IL	11	INDIAN HEMP
<i>Trachelospermum jasminoides</i> (Lindl.) Lem.	TX	11	CONFEDERATE JASMINE
<i>Vinca minor</i> L.	IL	14	COMMON PERIWINKLE
Araceae			
<i>Symplocarpus foetidus</i> (L.) Nutt.	IL	12	SKUNK CABBAGE
Asclepiadaceae			
<i>Asclepias amplexicaulis</i> Sm.	IL	8	BLUNTLEAF MILKWEED
<i>A. hirtella</i> (Pennell) Woodson	IL	10	GREEN MILKWEED
<i>A. incarnata</i> L.	IL	10	SWAMP MILKWEED
<i>A. latifolia</i> (Tort.) Raf.	TX	9	
<i>A. sullivantii</i> Engelm.	IL	7	SULLIVANT'S MILKWEED
<i>A. syriaca</i> L.	IL	9	COMMON MILKWEED
<i>A. tuberosa</i> L.	IL	9	BUTTERFLY WEED
<i>A. verticillata</i> L.	IL	9	WHORLED MILKWEED
<i>Cynanchum nigrum</i> (L.) Per.	IL	11	
<i>C. unifarium</i> (Scheele)			

Woods	TX	12	MILKVINE
<i>Gonolobus gonoocarpos</i> (Walt.) Perry	IL	12	CLIMBING MILKWEED
<i>Sarcostemma cyananchoides</i> Decne.	TX	14	CLIMBING MILKWEED
Balsaminaceae			
<i>Impatiens capensis</i> Meerb.	IL	16	JEWEL WEED OR SPOTTED TOUCH-ME-NOT
<i>I. pallida</i> Nutt.	IL	15	YELLOW JEWEL WEED
Berberidaceae			
<i>Podophyllum peltatum</i> L.	IL	13	MAY APPLE
Bignoniaceae			
<i>Campsis radicans</i> (L.) Seem.	IL	14	TRUMPET CREEPER
<i>Catalpa speciosa</i> Warden	IL	11	CIGAR-TREE
Boraginaceae			
<i>Cynoglossum officinale</i> L.	IL	12	COMMON HOUND'S TONGUE
Buxaceae			
<i>Simmondsia californica</i> (Link) Nutt.	CA	11	JOJOBA
Cactaceae			
<i>Opuntia humifusa</i> Raf.	IL	16	PRICKLY PEAR CACTUS
<i>O. engelmannii</i> Salm-Dyck	TX	15	PRICKLY PEAR
Campanulaceae			
<i>Campanula americana</i> L.	IL	10	TALL BELLFLOWER
<i>C. pyramidalis</i> L.	IL	10	CHIMNEY BELLFLOWER
<i>Lobelia siphilitica</i> L.	IL	13	GREAT BLUE LOBELIA
Cannabinaceae			
<i>Humulus japonicus</i> Sieb. & Zucc.	IL	12	HOPS
Capparidaceae			
<i>Polanisia graveolens</i> Raf.	IL	14	CLAMMYWEED
Caprifoliaceae			
<i>Lonicera tatarica</i> L.	IL	9	TATARIAN HONEYSUCKLE
<i>Sambucus canadensis</i> L.	IL, MT	10, 8	COMMON ELDER
<i>Symphoricarpos orbiculatus</i> Moench	IL	10	CORALBERRY
<i>Triosteum angustifolium</i> L.	IL, GA	12, 12	WILD COFFEE
<i>T. perfoliatum</i> L.	IL	10	TINKER'S WEED
Caryophyllaceae			
<i>Saponaria officinalis</i> L.	IL	12	BOUNCING BET
Chenopodiaceae			
<i>Atriplex canescens</i> (Pursh) Nutt.	AZ	13	SALT BUSH
<i>Chenopodium album</i> L.	IL	11	LAMB'S QUARTER
<i>Kochia scoparia</i> (L.) Roth	IL	13	SUMMER CYPRESS
<i>Salsola kali</i> L. var. <i>tenuifolia</i> Tausch	AZ	12	RUSSIAN THISTLE
<i>Sarcobatus verniculatus</i> (Hook.) Torr.	AZ	12	BLACK GREASEWOOD
Commelinaceae			
<i>Commelina erecta</i> L.	IL	14	DAY FLOWER
<i>Tradescantia ohiensis</i> Raf.	IL, WI	11, 12	SPIDERWORT
Compositae			
<i>Achillea millefolium</i> L.	IL	11	YARROW
<i>Actinomeris alternifolia</i> (L.) DC.	IL	11	WINGSTEM
<i>Ambrosia artemisiifolia</i> L. var. <i>elatior</i> (L.) Descourtils	AZ	12	COMMON RAGWEED
<i>A. psilostachya</i> DC. var. <i>coronopifolia</i> (T. & G.) Farw.	IL	13	WESTERN RAGWEED
<i>A. trifida</i> L.	IL	10	GIANT RAGWEED
<i>Arctium lappa</i> L.	IL	10	BURDOCK
<i>Artemisia abrotanum</i> L.	IL	12	SOUTHERNWOOD

<i>A.</i>	<i>vulgaris</i> L.	IL, CA	12, 10	COMMON MUGWORT
<i>Aster ericoides</i> L.		IL	13	HEATH ASTER
<i>A.</i>	<i>laevis</i> L.	IL	11	SMOOTH ASTER
<i>A.</i>	<i>novae-angliae</i> L.	IL	12	NEW ENGLAND ASTER
<i>A.</i>	<i>pilosus</i> Willd.	IL	13	
<i>A.</i>	<i>puniceus</i> L.	IL	15	SWAMP ASTER
<i>A.</i>	<i>shortii</i> Lindl.	IL	12	SHORT'S ASTER
<i>Bidens cernua</i> L.		IL	14	NODDING BEGGARTICKS
<i>B.</i>	<i>laevis</i> (L.) BSP.	IL	14	SMOOTH BEGGARTICKS
<i>Boltonia latisquama</i> Gray, var.				
<i>decurrens</i>		IL	15	
(T. & G.) Fern. & Griseb.				
<i>Cacalia atriplicifolia</i> L.		IL	8	PALE INDIAN PLANTAIN
<i>Carduus nutans</i> L.		WI	9	MUSK THISTLE
<i>Centaurea maculosa</i> Lam.		WI	13	SPOTTED KNPWEED
<i>C.</i>	<i>cochinensis</i> Bernh.	WI	13	KNPWEED
<i>Chrysopsis bakeri</i> Greene		IL	13	GOLDEN ASTER
<i>Chrysanthemus nauseosus</i> (Pall.)				
Britt.		AZ	8	RABBIT BRUSH
<i>Cichorium intybus</i> L.		IL	12	CHICORY
<i>Cirsium altissimum</i> (L.) Spreng.		IL	10	TALL THISTLE
<i>C.</i>	<i>arvense</i> (L.) Scop.	IL	11	CANADA THISTLE
<i>C.</i>	<i>discolor</i> (Muhl.) Spreng.	IL	10	FIELD THISTLE
<i>C.</i>	<i>muticum</i> Michx.	IL	14	SWAMP THISTLE
<i>C.</i>	<i>vulgare</i> (Savi) Tenore	IL	12	BULL THISTLE
<i>Coreopsis palmata</i> Nutt.		IL	12	TICKSEED
<i>C.</i>	<i>tripteris</i> L.	IL	12	TALL COREOPSIS
<i>Dyssodia papposa</i> (Vent.) Hitchc.		IL	12	FETID MARIGOLD
<i>Echinacea purpurea</i> L.		IL	12	PURPLE CONEFLOWER
<i>Ericameria laricifolia</i> (Gray)				
Shinners		AZ	15	
<i>Erigeron canadensis</i> L.		IL	13	CANADA FLEABANE
<i>Eupatorium altissimum</i> L.		IL	10	TALL BONESET
<i>E.</i>	<i>maculatum</i> L.	IL	13	SWAMP JOE-PYE WEED
<i>E.</i>	<i>perfoliatum</i> L.	IL	9	BONESET
<i>E.</i>	<i>purpureum</i> L.	IL	12	
<i>E.</i>	<i>rugosum</i> Houtt.	IL	12	WHITE SNAKEROOT
<i>E.</i>	<i>serotinum</i> Michx.	IL	12	LATE BONESET
<i>Gnaphalium obtusifolium</i> L.		IL	12	PEARLY EVERLASTING
<i>Grindelia squarrosa</i> (Pursh) Dunal		WI, NV	12, 11	GUMWEED OR TARWEED
<i>Helenium autumnale</i> L.		IL	11	SNEEZEWEEED
<i>Helianthus annuus</i> L.		IL	12	COMMON SUNFLOWER
<i>H.</i>	<i>divaricatus</i> L.	IL	11	WOODLAND SUNFLOWER
<i>H.</i>	<i>giganteus</i> L.	IL	11	GIANT SUNFLOWER
<i>H.</i>	<i>grosseserratus</i> Martens	IL	10	SAWTOOTH SUNFLOWER
<i>H.</i>	<i>hirsutus</i> Raf. var.			
<i>trachyphyllus</i> T. & G.		IL	12	HAIRY SUNFLOWER
<i>H.</i>	<i>occidentalis</i> L.	IL	11	WESTERN SUNFLOWER
<i>H.</i>	<i>tuberosus</i> L.	IL, WA	12, 12	JERUSALEM ARTICHOKE
<i>Heliopsis helianthoides</i> (L.) Sweet		IL	12	OXEYE
<i>Lactuca canadensis</i> L.		IL, GA	11, 11	WILD LETTUCE
<i>L.</i>	<i>floridana</i> (L.) Gaertn.	IL	12	BLUE LETTUCE
<i>L.</i>	<i>floridana</i> (L.) Gaertn., var.	IL	12	BLUE LETTUCE VARIETY
<i>villosa</i> (Jacq.) Cronq.				
<i>L.</i>	<i>scariola</i> L.	IL	13	PRICKLY LETTUCE
<i>Parthenium argentatum</i> Gray		8	8	GUAYULE
<i>P.</i>	<i>hysterophorus</i> L.	FL	14	WHITETOP
<i>P.</i>	<i>integrifolium</i> L.	IL, WI	13, 11	WILD-QUININE
<i>Polymnia canadensis</i> L.		IL	12	LEAFCUP
<i>Rudbeckia laciniata</i> L.		IL	12	YELLOW CONEFLOWER
<i>R.</i>	<i>subtomentosa</i> Pursh	IL	10	SWEET CONEFLOWER
<i>Senecio glabellus</i> Poir.		IL	11	BUTTER WEED
<i>Silphium integrifolium</i> Michx.		IL	10	ROGIN WEED
<i>S.</i>	<i>laciniatum</i> L.	IL	10	COMPASS PLANT

<i>S.</i>	<i>perfoliatum</i> L.	IL	11	CUP PLANT
<i>S.</i>	<i>terebinthinaceum</i> Jacq.	IL	10	PRAIRIE DOCK
<i>Solidago</i>	<i>altissima</i> L.	IL	11	TALL GOLDENROD
<i>S.</i>	<i>graminifolia</i> (L.) Salisb.	IL	10	GRASS LEAVED GOLDENROD
<i>S.</i>	<i>leavenworthii</i> Torr. & A. Gray	FL	8	EDISON'S GOLDENROD
<i>S.</i>	<i>nemoralis</i> Ait.	IL	12	DYER'S WEED GOLDENROD
<i>S.</i>	<i>ohioensis</i> Riddell	WI	10	OHIO GOLDENROD
<i>S.</i>	<i>rigida</i> L.	IL	10	STIFF GOLDENROD
<i>S.</i>	<i>speciosa</i> Nutt.	IL	11	SHOWY GOLDENROD
<i>S.</i>	<i>ulmifolia</i> Muhl.	IL	11	ELM LEAVED GOLDENROD
<i>Sonchus</i>	<i>arvensis</i> L.	IL	10	FIELD SOW THISTLE
<i>S.</i>	<i>oleraceus</i> L.	IL	11	COMMON SOW THISTLE
<i>Tagetes</i>	<i>minuta</i> L.	IL	14	MUSTER JOHN HENRY
<i>T.</i>	<i>patula</i> L.	IL	13	FLORIST'S MARIGOLD
<i>Tragopogon</i>	<i>pratensis</i> L.	IL	12	GOAT'S BEARD
<i>Vernonia</i>	<i>altissima</i> Nutt.	IL	10	IRONWEED
<i>V.</i>	<i>fasciculata</i> Michx.	IN	10	IRONWEED
<i>Xanthium</i>	<i>italicum</i> Moretti	IL	13	COCKLEBUR
<i>Zinnia</i>	<i>elegans</i> Jacq.	IL	14	CALIFORNIA GIANT ZINNIA
Convolvulaceae				
<i>Convolvulus</i>	<i>arcensis</i> L.	IL	14	FIELD BINDWEED
<i>C.</i>	<i>japonicus</i> Thunb.	IL	14	CREEPING JENNY
<i>Ipomoea</i>	<i>pandurata</i> (L.) G. F. W. Mey.	IL	14	WILD POTATO VINE
Cornaceae				
<i>Cornus</i>	<i>stolonifera</i> Michx.	IL	14	RED OSIER DOGWOOD
Corylaceae				
<i>Corylus</i>	<i>americana</i> Walt.	IL	12	HAZEL
Crassulaceae				
<i>Sedum</i>	<i>seiboldii</i> Sweet	IL	14	
	<i>Sedum</i> sp.	IL	15	
Cruciferæ				
<i>Barbara</i>	<i>vulgaris</i> R. Br.	IL	12	SPRING CRESS
<i>Brassica</i>	<i>nigra</i> (L.) Koch	IL	12	BLACK MUSTARD
<i>B.</i>	<i>oleracea</i> L. var. <i>botrytis</i> DC.	IL	14	PURPLE CAULIFLOWER
<i>Crambe</i>	<i>abyssinica</i> Hochst. ex R. E. Fries	IL	13	CRAMBE
<i>Lepidium</i>	<i>campestre</i> (L.) R. Br.	IL	13	COW CRESS
<i>Nasturtium</i>	<i>officinale</i> R. Br.	IL	16	WATERCRESS
Cucurbitaceæ				
<i>Cucurbita</i>	<i>ovifera</i> (L.) Alef.	IL	14	GARDEN ESCAPE GOURD
	<i>Sicyos</i> <i>angulatus</i> L.	IL	15	BUR CUCUMBER
Cupressaceæ				
<i>Cypressus</i>	<i>arizonica</i> Greene	AZ	12	ARIZONA CYPRESS
<i>Juniperus</i>	<i>osteosperma</i> (Torr.) Little	UT	12	UTAH JUNIPER
<i>J.</i>	<i>virginiana</i> L.	IL	11	RED CEDAR
Cyperaceæ				
<i>Cyperus</i> sp.		IL	15	SEDGE
<i>C.</i>	<i>esculentus</i> L.	IL	14	YELLOW NUTSEDGE
	<i>Scirpus</i> <i>validus</i> Vahl.	IL		BULRUSH
Dipsacaceæ				
<i>Dipsacus</i>	<i>laciniatus</i> L.	IL	12	CUT-LEAF TEASEL
	<i>D.</i> <i>sylvestris</i> Huds.	IL	12	BLUE TEASEL
Elaeagnaceæ				
<i>Elaeagnus</i>	<i>multiflora</i> Thunb.	IL	10	CHERRY ELAEAGNUS
Ericaceæ				
<i>Arctostaphylos</i>	<i>pringlei</i> Parry	AZ	12	

<i>A.</i>	<i>pungens</i> . HBK.	AZ	12	
	<i>Xylococcus bicolor</i> Nutt.	CA	10	
Euphorbiaceae				
	<i>Acalypha virginica</i> L.	IL	13	THREE-SEEDED MERCURY
	<i>Aleurites moluccana</i> (L.) Willd.	FL	10	CANDLENUT TREE
	<i>A.</i>	FL	10	SOFT LUMBANG
	<i>Clutia affinis</i> Sond.	3	12	
	<i>Croton glandulosus</i> L., var. <i>septentrionalis</i>	IL	12	CROTON
	Muell. Arg.			
	<i>Euphorbia antisyphilitica</i> Zucc.	S	10	CANDELILLA WAX
	<i>E.</i>	IL	11	FLOWERING SPURGE
	<i>E.</i>	IL	12	CYPRESS SPURGE
	<i>E.</i>	IL	10	TOOTHED SPURGE
	<i>E.</i>	4	12	
	<i>E.</i>	WI	11	LEAFY SPURGE
	<i>E.</i>	FL	8	
	<i>E.</i>	FL	11	
	<i>E.</i>	TX	13	GOLONDRINA
	<i>E.</i>	IL	11	PAINTED LEAF
	<i>E.</i>	CA	9	MOLE PLANT OR GOPHERWEED
	<i>E.</i>	IL	13	SPOTTED SPURGE
	<i>E.</i>	IL	12	SNOW-ON-THE-MOUNTAIN
	<i>E.</i>	TX	10	POINSETTIA
	<i>E.</i>	IL	13	PROSTRATE SPURGE
	<i>Pedilanthus</i> sp.	TX	11	SLIPPER
	<i>Ricinus communis</i> L.	NC	12	CASTOR BEAN
	<i>Sapium caudatum</i> Pittier	7	10	
Fagaceae				
	<i>Quercus imbricaria</i> Michx.	IL	10	SHINGLE OAK
	<i>Q.</i>	IL	11	BUR OAK
	<i>Q.</i>	IL	12	BLACK JACK OAK
	<i>Q.</i>	IL	12	CHESTNUT OAK
	<i>Q.</i>	IL	12	PIN OAK
	<i>Q.</i>	AZ	12	SHRUB LIVE OAK
Garryaceae				
	<i>Garrya wrightii</i> Torr.	AZ	10	WRIGHT SILKTASSEL
Gramineae				
	<i>Agropyron repens</i> (L.) Beauv.	IL	10	QUACK GRASS
	<i>Andropogon gerardi</i> Vitman	GA	12	BIG BLUESTEM
	<i>A.</i>	IL, GA	11, 12	LITTLE BLUESTEM GRASS
	<i>Aristida oligantha</i> Michx.	IL		THREE AWNED GRASS
	<i>Arundo donax</i> L.	IL	12	GIANT REED
	<i>Avena sativa</i> L.	WI	14	OATS
	<i>Bromus inermis</i> Leyss.	IL	14	SMOOTH BROME
	<i>B.</i>	IL	15	CHESS
	<i>Cenchrus longispinus</i> (Hack.) Fern.	IL	15	SANDBUR
	<i>Dactylis glomerata</i> L.	IL	16	ORCHARD GRASS
	<i>Echinochloa crusgalli</i> (L.) Beauv.	IL	13	BARNYARD GRASS
	<i>E.</i>	IL	15	WALTER'S BARNYARD GRASS
	<i>Eleusine indica</i> (L.) Gaertn.	IL	13	GOOSE GRASS
	<i>Elymus canadensis</i> L.	IL	11	WILD RYE
	<i>Erianthus trinii</i> (Hack.) Hack.	GA	13	
	<i>Festuca arundinacea</i> Schreb.	MO	11	FESCUE (KY-31)
	<i>F.</i>	MO	11	FESCUE (KENHY)
	<i>Hordeum jubatum</i> L.	IL	15	WILD BARLEY
	<i>H.</i>	WI	12	BARLEY
	<i>Hystrichopoda patula</i> Moench	IL	15	BOTTLEBRUSH GRASS
	<i>Leersia oryzoides</i> (L.) Sw.	IL	12	CUT GRASS
	<i>L.</i>	IL	14	WHITE GRASS
	<i>Leptoloma cognatum</i> (Schultes) Chase	IL		FALL WITCHGRASS

<i>Miscanthus sinensis</i> Anderss.	GA	12	EULALIA
<i>Panicum cirgatum</i> L.	IL	13	SWITCHGRASS
<i>Paspalum exaltatum</i> Presl.	GA	12	
<i>P. quadrifarium</i> Lam.	GA	12	
<i>Pennisetum americanum</i> (L.) K. Schum.	GA	13	PEARL MILLET
<i>Phalaris arundinacea</i> L.	IL	12	REED CANARY GRASS
<i>P. canariensis</i> L.	IL	12	CANARY GRASS
<i>Phragmites communis</i> Trin.	IL	15	REED GRASS
<i>Setaria faberii</i> Herrm.	IL	13	GIANT FOXTAIL
<i>S. glauca</i> (L.) Beauv.	IL	15	YELLOW FOXTAIL
<i>Sorghastrum nutans</i> (L.) Nash	IL	15	INDIAN GRASS
<i>Sorghum alnum</i> Patrodi	GA	12	COLUMBUS GRASS
<i>S. bicolor</i> (L.) Moench.	GA	13	GRAIN SORGHUM
<i>S. halepense</i> (L.) Pers.	GA	11	JOHNSON GRASS
<i>Spartina pectinata</i> Link	IL	14	CORD GRASS
<i>Trioda flava</i> (L.) Smyth forma <i>cuprea</i> (Jacq.) Fosberg	IL	13	PURPLE TOP GRASS
<i>Tripsacum dactyloides</i> L.	IL	12	GAMA GRASS
<i>Triticum</i> sp.	IL	14	WHEAT STRAW
<i>Zea mays</i> L.	IL, GA	12, 12	MAIZE
 Guttiferae			
<i>Hypericum sphaerocarpum</i> Michx.	IL	12	ST. JOHN'S WORT
 Hamamelidaceae			
<i>Liquidambar styraciflua</i> L.	IL	12	SWEET GUM
 Hippocastanaceae			
<i>Aesculus hippocastanum</i> L.	IL	11	HORSE CHESTNUT
 Hydrophyllaceae			
<i>Erydicyon trichocalyx</i> A. Heller var. <i>lanatum</i> Jepson	CA	10	
<i>Hydrophyllum virginianum</i> L.	IL	11	VIRGINIA WATERLEAF
 Juglandaceae			
<i>Juglans nigra</i> L.	IL	11	BLACK WALNUT
 Labiateae			
<i>Agastache nepetoides</i> (L.) Ktze.	IL	11	GIANT HYSSOP
<i>A. scrophulariaefolia</i> (Willd.) Ktze.	IL	11	PURPLE GIANT HYSSOP
<i>Ajuga genevensis</i> L.	IL	13	BUGLEWEED
<i>Glechoma hederaea</i> L.	IL	15	GILL-OVER-THE-GROUND
<i>Hedemora hispida</i> Pursh	IL	15	PENNYROYAL
<i>Lamium galeobdolon</i> Crantz.	IL	11	YELLOW ARCHANGEL
<i>L. maculatum</i> L.	WI	12	HENBIT
<i>Leonurus cardiaca</i> L.	IL	11	MOTHERWORT
<i>Lycopus americanus</i> Muhl.	WI	11	WATER HOARHOUND
<i>Marrubium vulgare</i> L.	IL	13	HOREHOUND
<i>Melissa officinalis</i> L.	IL	11	LEMON BALM
<i>Mentha alopecuroides</i> Hull	IL	12	MINT
<i>M. arvensis</i> L. forma <i>glabra</i> (Benth.) S.R. Stewart	WI	11	
<i>M. arvensis</i> L. var. <i>ciliosa</i> (Benth.) S.R. Stewart	WI	12	
<i>M. piperita</i> L.	IL	13	PEPPERMINT
<i>Mentha</i> sp.	WI	12	MINT
<i>Monarda citriodora</i> Cerv. ex. Lag.	IL	14	LEMON BALM
<i>M. didyma</i> L.	IL	12	OSWEGO TEA
<i>M. fistulosa</i> L.	IL, WI	11, 11	WILD BERGAMOT
<i>M. punctata</i> L.	IL	11	HORSE MINT
<i>Nepeta cataria</i> L.	IL	11	CATNIP
<i>Ocimum basilicum</i> L.	IL	11	PURPLE BASIL
<i>Physostegia virginiana</i> (L.) Benth.	NC	13	OBEDEDIENT PLANT
<i>Prunella vulgaris</i> L.	WI	14	SELFHEAL

<i>Pycnanthemum incanum</i> (L.) Michx.		IL, IN	10, 10	MOUNTAIN MINT
<i>P. virginianum</i> (L.) Durand & Jackson	WI		12	
<i>Salvia officinalis</i> L. var. <i>tenuoir</i> Alef.	IL	13		SAGE
<i>Scutellaria lateriflora</i> L.	IL	13		SKULLCAP
<i>Stachys palustris</i> L.	IL, WI	13, 13		WOUNDWORT
<i>S. palustris</i> L. var. <i>homotricha</i> Fern.	IL	13		HEDGE NETTLE
<i>Teucrium canadense</i> L.	IL	10		AMERICAN GERMANDER
<i>T. occidentale</i> Gray	IL	13		GERMANDER
Lauraceae				
<i>Sassafras albidum</i> (Nutt.) Nees	IL	10		SASSAFRAS
Leguminosae				
<i>Acacia</i> sp.	AZ	11		
<i>A. constricta</i> Benth.	AZ	11		WHITE THORN
<i>A. greggi</i> A. Gray	AZ	12		CAT'S CLAW
<i>Amorpha canescens</i> Pursh	IL	10		LEAD PLANT
<i>A. fruticosa</i> L.	IL	11		FALSE INDIGO
<i>Amphicarpa bracteata</i> (L.) Fern.	IL, WI	15, 13		HOG PEANUT
<i>Apios americana</i> Medic.	IL	14		GROUNDNUT
<i>Arachis hypogaea</i> L.	IL	14		PEANUT
<i>Astragalus americana</i> (Hook.) Jones	5	11		MILK VETCH
<i>A. absurgens</i> Pall.				
var. <i>striatus</i> Nutt.	5	11		MILK VETCH
<i>A. canadensis</i> L.	WI	13		MILK VETCH
<i>A. miser</i> Doug. ex Hooker				
var. <i>miser</i>	5	14		
<i>Baptisia leucantha</i> T. & G.	IL	12		WHITE INDIGO
<i>B. leucophaea</i> Nutt.	IL	13		CREAM WILD INDIGO
<i>B. tinctoria</i> (L.) R. Br.	OH	10		YELLOW WILD INDOGO
<i>Calliandra eriophylla</i> Benth.	AZ	10		FALSE MESQUITE
<i>Cassia didymobotrya</i> Fresen.	4	12		
<i>C. hebecarpa</i> Fern.	IL	12		PARTRIDGE PEA, WILD SENNA
<i>C. kirkii</i> Oliv.	4	14		
<i>Coronilla varia</i> L.	IL	15		CROWN VETCH
<i>Crotalaria incana</i> L.	GA	14		SHACKSHACK
<i>C. juncea</i> L.	GA	13		SUNN HEMP
<i>C. lasiocarpa</i> Polh.	4	13		
<i>C. ochroleuca</i> G. Don.	GA	13		
<i>Cytisus scoparius</i> (L.) Link	5	10		SCOTCH BROOM
<i>Desmanthus illinoensis</i> (Michx.) Mac M.	IL	11		PRAIRIE MIMOSA
<i>Lesmodium canadense</i> (L.) DC.	IL	13		TICKSEED
<i>D. cuspidatum</i> (Muhl.) Loud	IL, WI	11, 10		
<i>D. glutinosum</i> (Muhl.) Wood	IL, WI	12, 13		
<i>D. illinoense</i> Gray	IL	13		TICK PREFOIL
<i>D. nicaraguense</i> Oerst. ex Benth.	GA	12		
<i>D. repandum</i> (Vahl) DC.	4	13		
<i>Droogmansia pteropus</i> (Baker) De Wild.	4	12		
<i>Eriosema montanum</i> Baker F.	4	12		
<i>Flemingia grahamiana</i> Wight & Arn.	4	12		
<i>Gleditsia triacanthos</i> L.	IL	11		HONEY LOCUST
<i>Glycine max</i> (L.) Merr.	IL	13		SOYBEAN
<i>Gymnocladus dioica</i> (L.) K. Koch	IL	9		KY. COFFEE TREE
<i>Humularia drepanocephala</i> (Baker) Davign	4	13		
<i>Indigofera hilaris</i> Eckl. & Zeyh.	4	13		
<i>I. longibracteata</i> Engl.	4	12		

Kotschya deschynomoides (Baker)

<i>De Wit & Davign</i>	4	12	
<i>K. africana</i> Endl.	4	12	
<i>K. africana</i> var. <i>bequaertii</i> (Dewild.) Verde.	4	12	
<i>K. recurvifolia</i> (Taub.) E. White	4	12	
<i>Lathyrus hygrophilus</i> Taub.	4	16	
<i>L. japonicus</i> Willd.	5	13	MARITIME PEA
<i>L. latifolius</i> L.	IL	15	PERENNIAL PEA
<i>L. ochroleucus</i> Hook.	5	14	CREAM PEA
<i>L. palustris</i> L.	WI	14	MARSH PEA
<i>L. palustris</i> L. var. <i>linearifolius</i> Ser.	WI	14	MARSH PEA
<i>L. venosus</i> Muhl.	WI	14	VEINY PEA
<i>Lespedeza capitata</i> Michx.	IL	12	BUSH CLOVER
<i>L. striata</i> (Thunb.) H. & A.	IL	10	JAPANESE CLOVER
<i>Lotononis laxa</i> Eckl. & Zeyh.	4	13	
<i>Lotus corniculatus</i> L.	IL	12	BIRD'S FOOT TREFOIL
<i>Lupinus arboreus</i> Simms.	5	9	TREE LUPINE
<i>L. nootkatensis</i> Donn.	5	10	NOOTKA LUPINE
<i>L. princei</i> H. Harms	4	13	
<i>Macrotyloma axillare</i> (E. Meyer) Verde.	4	12	
<i>Medicago falcata</i> L.	IL	12	SICKLE ALFALFA
<i>M. lupulina</i> L.	5, IL	13, 10	BLACK MEDIC
<i>M. sativa</i> L.	IL	12	ALFALFA
<i>Melilotus alba</i> Desr.	IL	11	WHITE SWEET CLOVER
<i>M. officinalis</i> (L.) Lam	IL	12	YELLOW SWEET CLOVER
<i>Oxytropis splendens</i> Dougl.	5	12	CRAZY WEED
<i>Parkinsonia aculeata</i> L.	AZ	10	JERUSALEM THORN
<i>Petalostemum candidum</i> (Willd.) Michx.	IL	12	WHITE PRAIRIE CLOVER
<i>P. purpureum</i> (Vent.) Rydb.	IL	13	PURPLE PRAIRIE CLOVER
<i>Phaseolus coccineus</i> L.	IL	14	SCARLET RUNNER
<i>P. vulgaris</i> L.	IL	12	PURPLE BEAN
<i>P. vulgaris</i> L.	IL	13	GREEN BEAN
<i>Phyllocarpus sepentrionalis</i> J.D. Sm.	FL	11	
<i>Pisum sativum</i> L.	IL	17	GARDEN PEA
<i>P. sativum</i> L.	IL	15	AMERICAN WONDER PEA
<i>Prosopis juliflora</i> DC.	AZ	11	MESQUITE
<i>P. velutina</i> Wooton	AZ	12	VELVET MESQUITE
<i>Psoralea onobrychis</i> Nutt.	IL	11	
<i>P. tenuiflora</i> Pursh	IL	13	SCURF PEA
<i>Pueraria lobata</i> (Willd.) Olive	IL	14	KUDZU VINE
<i>Robinia hispida</i> L.	IL	18	BRISTLY LOCUST
<i>R. pseudo-acacia</i> L.	IL	11	BLACK LOCUST
<i>Samanea saman</i> (Jacq.) Merr	IL	10	RAIN TREE
<i>Sesbania arabica</i> Hochst. ex Steud.	GA	12	
<i>S. cannabina</i> Poir.	GA	12	
<i>Strophostyles helvolola</i> (L.) Ell.	IL	14	WILD BEAN
<i>Tephrosia virginiana</i> (L.) Pers.	IL	10	GOAT'S RUE
<i>Trifolium hybridum</i> L.	IL	13	ALSIKE CLOVER
<i>T. pratense</i> L.	IL	12	RED CLOVER
<i>T. procumbens</i> L.	IL	14	LOW HOP CLOVER
<i>T. repens</i> L.	IL	15	WHITE CLOVER
<i>Vicia americana</i> Muhl.	5	15	VETCH
<i>V. gigantea</i> Hook.	5	15	GIANT VETCH
<i>V. hirsuta</i> (L.) S. F. Gray	5	15	TINY VETCH
<i>V. villosa</i> Roth	IL	12	HAIRY VETCH
<i>Wisteria sinensis</i> Sweet	IL	16	CHINESE WISTERIA

Liliaceae				
<i>Asparagus officinalis</i> L.	IL	11	GARDEN ASPARAGUS	
<i>Hemerocallis fulva</i> L.	IL	15	DAY LILY	
<i>Polygonatum biflorum</i> (Walt.) Ell.	IL	12	SOLOMON'S SEAL	
<i>Smilacina racemosa</i> (L.) Desf.	IL	13	FALSE SOLOMON'S SEAL	
<i>Smilax glauca</i> Walt.	IL	13	SAW BRIAR	
<i>S.</i> <i>herbacea</i> L.	IL	13	CARRION FRUIT	
<i>S.</i> <i>rotundifolia</i> L.	IL	15	GREENBRIAR	
<i>S.</i> <i>tamnoides</i> L. var. <i>hispida</i> (Muhl.) Fern.	IL	15	CAT BRIAR	
<i>Uvularia perfoliata</i> L.	IL	12	BELLWORT	
Lythraceae				
<i>Ammannia coccinea</i> Rottb.	IL	17		
<i>Cuphea viscosissima</i> Jacq.	IL	13	CLAMMY CUPHEA	
<i>Lysimachia nummularia</i> L.	IL	15	MONEYWORT	
<i>Lythrum alatum</i> Pursh	IL	14	WINGED LOOSESTRIFE	
<i>L.</i> <i>salicaria</i> L.	WI	13	SPIKED LOOSESTRIFE	
Malvaceae				
<i>Abelmoschus esculentus</i> (L.) Moench	6, GA	12, 12	OKRA	
<i>Abutilon theophrasti</i> Medic.	IL	11	VELVETLEAF	
<i>Althea rosea</i> Cav.	IL	12	HOLLYHOCK	
<i>Hibiscus cannabinus</i> L.	IL, IN, LA	13, 13, 13	KENAF	
<i>H.</i> <i>cispalatinus</i> St.-Hil.	GA	12	OKRA	
<i>H.</i> <i>militaris</i> Cav.	IL	12	HALBERD-LEAVED MALLOW	
<i>H.</i> <i>trionum</i> L.	IL	13	FLOWER-OF-AN-HOUR	
<i>Napaea dioica</i> L.	IL	15	GLADE MALLOW	
<i>Sida spinosa</i> L.	IL	12	PRICKLY MALLOW	
Menispermaceae				
<i>Menispermum canadense</i> L.	IL	13	MOONSEED	
Moraceae				
<i>Ficus elastica</i> Roxb.	TX	14	RUBBER PLANT	
<i>F.</i> <i>obtusifolia</i> HBK.	7	14		
<i>F.</i> <i>yoponensis</i> Desv.	7	13		
<i>Maclura pomifera</i> (Raf.) Schneid.	IL	11	OSAGE ORANGE	
<i>Morus alba</i> L.	IL	11	WHITE MULBERRY	
Nyctaginaceae				
<i>Mirabilis jalapa</i> L.	NC	13	FOUR-O'CLOCK	
<i>M.</i> <i>nyctaginea</i> (Michx.) Mac M.	IL	13	WILD FOUR-O'CLOCK	
Oleaceae				
<i>Fraxinus nigra</i> Marsh.	IL	12	BLACK ASH	
<i>F.</i> <i>americana</i> L.	IL	12	WHITE ASH	
<i>F.</i> <i>pennsylvanica</i> Marsh.	IL	12	GREEN ASH	
<i>Syringa vulgaris</i> L.	IL	12	COMMON LILAC	
Onagraceae				
<i>Epilobium coloratum</i> Biehler	IL	13	PURPLE LEAF WILLOWEED	
<i>Gaura biennis</i> L.	IL	11	GAURA	
<i>Oenothera biennis</i> L.	IL	12	EVENING PRIMROSE	
<i>O.</i> <i>rhombipetala</i> Nutt.	IL	13	EVENING PRIMROSE	
Oxalidaceae				
<i>Oxalis stricta</i> L.	IL	13	YELLOW WOOD SORREL	
Paeoniaceae				
<i>Paeonia lactiflora</i> Pall.	IL	11	GARDEN-ESCAPE PEONY	
Papaveraceae				
<i>Chelidonium majus</i> L.	IL	11	CELANDINE POPPY	
Phytolaccaceae				
<i>Phytolacca americana</i> L.	IL	10	POKEWEED	

Plantanaceae

<i>Plantanus occidentalis</i> L.	IL	12	SYCAMORE
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Pinaceae

<i>Larix decidua</i> Mill.	IL	11	EUROPEAN LARCH
<i>Picea abies</i> (L.) Karst.	IL	11	NORWAY SPRUCE
<i>Pinus banksiana</i> Lamb.	IL	11	JACK PINE
<i>P. edulis</i> Engelm.	AZ	11	PINYON PINE
<i>P. sylvestris</i> L.	IL	11	SCOTCH PINE

Polygonaceae

<i>Polygonum cuspidatum</i> Sieb. & Zucc.	IL	13	JAPANESE KNOTWEED
<i>P. orientale</i> L.	IL		
<i>P. pensylvanicum</i> L.	IL	13	PINKWEED
<i>P. scandens</i> L.	IL	14	CLIMBING FALSE BUCKWHEAT
<i>Rumex crispus</i> L.	IL	13	YELLOW DOCK

Portulacaceae

<i>Portulaca oleracea</i> L.	IL	15	PURSLANE
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Primulaceae

<i>Lysimachia ciliata</i> L.	IL	13	FRINGED LOOSESTRIFE
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Ranunculaceae

<i>Anemone canadensis</i> L.	IL	12	CANADA ANEMONE
<i>A. cylindrica</i> Gray	IL	12	THIMBLEWEED
<i>Thalictrum dasycarpum</i> Fisch. & Lall.	WI	13	TALL MEADOW RUE

Rhamnaceae

<i>Ceanothus americanus</i> L.	IL	10	NEW JERSEY TEA
<i>C. tomentosus</i> Parry	CA	12	WOLLY LEAF CEANOTHUS
<i>Rhamnus alnifolia</i> L'Her	WI	12	ALDER BUCKTHORN

Rosaceae

<i>Adenostoma fasciculatum</i> Hook. & Arn.	CA	12	GREASEWOOD
<i>Aruncus dioicus</i> (Walt.) Fern.	IL	13	GOAT'S BEARD
<i>Cercocarpus betuloides</i> Nutt. ex Torr. & A. Gray	AZ	12	
<i>Crataegus mollis</i> (T. & G.) Scheele	IL	12	HAWTHORN
<i>Heteromeles arbutifolia</i> (Ait.) M.J. Roem.	CA	11	CHRISTMAS BERRY
<i>Prunus americana</i> Marsh.	IL	10	WILD PLUM
<i>P. armeniaca</i> L.	IL	11	APRICOT
<i>P. persica</i> (L.) Batsch	IL	11	PEACH
<i>P. serotina</i> Ehrh.	IL	12	BLACK CHERRY
<i>Pyrus ioensis</i> (Wood) Bailey	IL	12	WILD CRAB
<i>Rosa carolina</i> L.	IL	11	CAROLINA ROSE
<i>R. multiflora</i> Thunb.	IL	12	MULTIFLORA ROSE
<i>R. setigera</i> Michx.	IL	12	PRAIRIE ROSE
<i>Rubus allegheniensis</i> Porter	IL	11	BLACKBERRY
<i>R. occidentalis</i> L.	IL	12	BLACK RASPBERRY
<i>Spirea bumalda</i> Bury	IL	11	SPIREA ANTHONY WATERER

Rubiaceae

<i>Cephalanthus occidentalis</i> L.	IL	12	BUTTONBUSH
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Rutaceae

<i>Dictamnus albus</i> L.	IL	11	GAS PLANT
<i>Xanthoxylum americanum</i> Mill.	IL	12	PRICKLY ASH

Salicaceae

<i>Populus alba</i> L.	IL	11	SILVER POPLAR
<i>P. deltoides</i> Marsh.	IL	11	COTTONWOOD
<i>P. nigra</i> L. var. <i>italicia</i> Muenchh.	IL	12	LOMBARDY POPLAR
<i>P. tremuloides</i> Michx.	IL	11	TREMBLING ASPEN

<i>Salix babylonica</i> L.	IL	10	WEEPING WILLOW
<i>S. discolor</i> Muhl.	IL	13	LARGE PUSSY WILLOW
<i>S. interior</i> Rowlee	IL	14	SANDBAR WILLOW
<i>S. nigra</i> Marsh.	IL	14	BLACK WILLOW
<i>Salix</i> sp.	IL	15	WILLOW
Saururaceae			
<i>Saururus cernuus</i> L.	IL	16	LIZARD'S TAIL
Saxifragaceae			
<i>Ribes americanum</i> Mill.	IL	12	WILD BLACK Currant
<i>R. cynosbati</i> L.	IL	11	PRICKLY GOOSEBERRY
Scrophulariaceae			
<i>Linaria vulgaris</i> Hill	IL	13	BUTTER & EGGS
<i>Mimulus ringens</i> L.	IL	14	MONKEY FLOWER
<i>Pedicularis palustris</i> L.	IL	15	SWAMP LOUSEWORT
<i>Scrophularia marilandica</i> L.	IL	13	CARPENTER'S SQUARE
<i>Verbascum blattaria</i> L.	IL	12	MOTH MULLEIN
<i>V. thapsus</i> L.	IL	12	COMMON MULLEIN
<i>Veronicastrum virginicum</i> (L.) Farw.	IL	12	CULVER'S ROOT
Simarubaceae			
<i>Ailanthus altissima</i> (Mill.) Swingle	IL	11	TREE OF HEAVEN
Solanaceae			
<i>Capsicum annuum</i> L. var. <i>grossum</i> Sendt.	IL	13	CALIFORNIA WONDER PEPPER
<i>Datura stramonium</i> L.	IL	11	JIMSON WEED
<i>Nicotiana tabacum</i> L.	IL	10	TOBACCO
<i>Physalis heterophylla</i> Nees	IL	13	CLAMMY GROUND CHERRY
<i>P. virginiana</i> Mill.	IL	12	VIRGINIA GROUND CHERRY
<i>Solanum carolinense</i> L.	IL	13	HORSE NETTLE
<i>S. dulcamara</i> L.	IL	15	DEADLY NIGHTSHADE
<i>S. nigrum</i> L.	IL	12	BLACK NIGHTSHADE
Tiliaceae			
<i>Tilia americana</i> L.	IL	12	BASSWOOD
Typhaceae			
<i>Typha angustifolia</i> L.	IL	12	NARROW LEAVED CATTAIL
<i>T. latifolia</i> L.	IL	15	BROAD LEAVED CATTAIL
Ulmaceae			
<i>Ulmus rubra</i> Muhl.	IL	11	SLIPPERY ELM
Umbelliferae			
<i>Angelica atropurpurea</i> L.	IL	13	PURPLE ANGELICA
<i>Berula pusilla</i> (Nutt.) Fern.	IL	16	WILD CELERY
<i>Bifora radians</i> Bieb.	9	9	
<i>Cicuta maculata</i> L.	IL	15	WATER HEMLOCK
<i>Conium maculatum</i> L.	IL	12	POISON HEMLOCK
<i>Daucus carota</i> L.	IL	15	QUEEN ANNE'S LACE
<i>Foeniculum vulgare</i> Mill.	IL	13	FENNEL
<i>Heracleum maximum</i> Bartr.	IL	13	COW PARSNIP
<i>Osmorhiza claytoni</i> (Michx.) C. B. Clarke	IL	14	HAIRY SWEET CICELY
<i>Zizia aurea</i> (L.) W.D. J. Koch	IL	11	GOLDEN ALEXANDER
Urticaceae			
<i>Boehmeria cylindrica</i> (L.) Sw.	IL	13	FALSE NETTLE
<i>Urtica procera</i> Muhl.	IL	12	TALL NETTLE
Verbenaceae			
<i>Lippia lanceolata</i> Michx.	IL	13	FOG FRUIT
<i>Verbena hastata</i> L.	IL		BLUE VERVAIN
<i>V. stricta</i> Vent.	IL	13	HOARY VERVAIN
<i>V. urticifolia</i> L.	IL	12	WHITE VERVAIN

Vitaceae

Vitis riparia Michx. IL 14 FROST GRAPE

Zygophyllaceae

Larrea tridentata (DC.) Cov. AZ 12 CRESOTE BUSH

Nomenclature in accordance with Gray's Manual of Botany, 8th Edition, 1970, D. Van Nostrand Co. Horticulture species according to Hortus Third, L. H. & E. Z. Bailey, 1976, MacMillan Publishing Co., Inc.

¹South Africa and Tanzania samples were obtained from Raltech Inc., Madison, WI.

²Species without ratings are being evaluated.

³South Africa.

⁴Tanzania.

⁵Vancouver, British Columbia.

⁶Puerto Rico.

⁷Canal Zone.

⁸Mexico.

⁹Plant was grown in Jacksonville, IL from seed collected in Yugoslavia.

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